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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,823	11/06/2001	Terry V. Clapp	476-2050.1	8712

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EXAMINER	
KIANNI, KAVEH C	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/993,823	CLAPP, TERRY V.	
	Examin r	Art Unit	
	Kevin C Kianni	2877	

-- Th MAILING DATE f this communication appears on the c ver sheet with the c rrespondenc address --

Peri d for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-10 and 13-17* is/are rejected.

7)☒ Claim(s) *6,11 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Allowable Subject Matter

1. Claims 6 and 11-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 6 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein at least a portion of said material is adiabatically tapered such that at least one of the optical-signal coupling from the wave-guide to the material, or from the material to the wave-guide, is substantially adiabatic in combination with the rest of the limitations of the base claim.

Claims 11 would be allowable once it is rewritten in corrected form, as stated above, because the prior art of record, taken alone or in combination, fails to disclose or render obvious the splitter means arranged to split an optical signal input to said unit so as to send a portion of the input signal to a respective input of each waveguide device, the splitting means being arranged such that the signals received at the respective optical waveguides have an electrical field parallel to the respective strip waveguides in combination with the rest of the limitations of the base claim. Claim 12 depends to claim 11 and therefore it would be also allowable.

Claim Rejections –

35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

and - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 17 is rejected under 35 U.S.C. 102(b) as being anticipated by Chandross et al.(Chandross) (US 6,002,823).

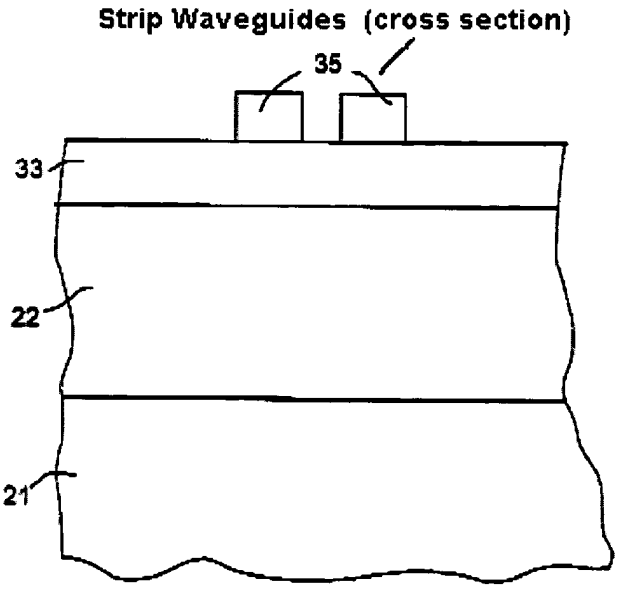

FIG. 6

Below is a relevant quotation about 'strip loaded waveguides' (see col. 5, lines 48-51)--which is essentially analogous in structure shown in applicants' drawing such as figures 3 and 5, item strip waveguide 106 and referred to in the specification at least page 3, lines 31-34 and page 8, 3rd parag.—as follows:

> The waveguide structures in the devices described herein are conventional waveguides with a strip-like configuration and typically rectangular, or preferably essentially square, in cross section.

Regarding claim 17, Chandross teaches a method of manufacturing an optical waveguide device (shown in at least figure 6, above; see col. 5, lines 48-51), the method comprising the steps of: forming an optical input (see figures 1 and 2, item input section of the waveguide structure/layers formed for receiving input signal Pi; col. 2, lines 12-40); forming an optical output (see fig. 1 and 2, item output section of the waveguide structure for outputting output signal Po; col. 2, lines 12-40); forming an optical waveguide comprising a strip-loaded waveguide connected between said input and said output (see col. 5, lines 48-51; wherein, as shown in at least figures 1-3, item

waveguides 12 and 13 are strip loaded waveguides formed on the waveguide structure); and positioning a material adjacent at least a portion of said waveguide such that an optical signal transmitted along the waveguide will couple in and out of said additional material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transmitted in and out of polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54).

5. Claims 1-5, 7-10, 13 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chandross et al. (US 6,002,823).

Regarding claim 1, Chandross teaches an optical waveguide device (shown in at least fig. 1, see abstract) comprising:
at least one optical input Pi for receiving an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); at least one optical output Po for the output of an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); and an optical waveguide connected between said input Pi and said output Po (see item waveguide between input Pi and output Po); wherein said optical waveguide comprises a strip loaded waveguide 12/13 (see col. 5, lines 48-51; wherein, as shown in at least figures 1 and 3, item waveguides 12/13 are strip loaded waveguides formed on the waveguide structure), and the device further comprises an additional material positioned adjacent at least a portion of the waveguide (see col. 3, lines 58-63 and col. 4, lines 51-54), the material having a refractive index, such that an optical signal guided by the waveguide will at least partially couple into the material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12

and 13 and light/signals are transferred through/via polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54).

However, Chandross does not specifically teach wherein the above material having a higher refractive index than the waveguide. Nevertheless, Chandross states that the material has a high refractive index that optically couples the waveguides 12 and 13 (see abstract and col. 4, lines 51-54). Thus, It would have been to a person of ordinary skill in the art when the invention was made to use the above material with a high refractive index than the waveguide an obvious matter of design choice, since applicant has not disclosed that the choice of having a material with higher index of refraction than the waveguide solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the material (polymer), since the reference as well as the claimed invention both use substantially the same materials for waveguide structures, and because such choice of material would provide a tunable coupler with improved tuning sensitivity and response (see col. 1, lines 48-51).

Regarding claims 2-5 and 7, Chandross further teaches wherein said additional material has optical properties that can be controllably altered (see abstract); wherein said material is an electro-optic material (see col. 3, lines 58-67); wherein said material is selected from the group consisting of a polymer or other oligomer, dendrimer, liquid crystal or supramolecular system (see col. 3, lines 58-67); wherein said waveguide is formed from silica on silicon (see at least col. 2, lines 12-20); a cladding layer, said

cladding layer being arranged to substantially overlay the additional material (see col. 5, lines 56-65).

Regarding claim 8, Chandross teaches an optical unit (shown in at least fig. 1, see abstract) for the optical processing of an optical signal (this recitation has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. Kropa v. Robie, 88 USPQ 478 (CCPA 1951)), the unit comprising:

at least one optical input Pi for receiving an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); at least one optical output Po for the output of an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); and an optical waveguide connected between said input Pi and said output Po (see item waveguide between input Pi and output Po); wherein said optical waveguide comprises a strip loaded waveguide 12/13 (see col. 5, lines 48-51; wherein, as shown in at least figures 1 and 3, item waveguides 12/13 are strip loaded waveguides), and the unit further comprises an additional material positioned adjacent at least a portion of the waveguide (see col. 3, lines 58-63 and col. 4, lines 51-54), the material having a refractive index, such that an optical signal guided by the waveguide will at least partially couple into the material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transferred through/via polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54), the unit further comprising control means 43 arranged to alter the optical properties of said material (see col. 4, lines 45-54). Regarding the limitation the

material having a higher refractive index than the waveguide, the arguments presented in rejection of claim 1, above, is analogous in rejection of claim 8.

Regarding claims 9-10 and 13, Chandross further teaches the unit being arranged to perform the functions of at least one of a tunable filter, a modulator, a demodulator, a switch, a polarization mode dispersion compensator or a chromatic dispersion compensator (shown at least in at least fig. 1, item transmitted signal Pi in waveguide 12 is switched to waveguide 13 having output Po; see also background of the prior art in which tunable couplers are used for as filters col. 1, lines 9-18+); wherein said waveguide is arranged as at least one of a Mach-Zehnder, a ring resonator, or an arrayed waveguide grating (see col. 1, lines 9-15); a light source arranged to provide an optical input to said device (see col. 2, lines 14-15).

Regarding claim 16, Chandross teaches a method of using an optical waveguide device (shown in at least fig. 1; col. 3, lines 20-64+), the optical waveguide device comprising: at least one optical input Pi for receiving an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); at least one optical output Po for the output of an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); and an optical waveguide connected between said input Pi and said output Po (see item waveguide between input Pi and output Po); wherein said optical waveguide comprises a strip loaded waveguide 12/13 (see col. 5, lines 48-51; wherein, as shown in at least figures 1 and 3, item waveguides 12/13 are strip loaded waveguides), and the device further comprises an additional material positioned adjacent at least a portion of the waveguide (see col. 3, lines 58-63 and col. 4, lines 51-54), the material having a refractive index, such that an optical signal guided

by the waveguide will at least partially couple into the material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transferred through/via polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54); the signal Pi being transmitted along said optical waveguide 12, and coupling in and out of said additional material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transmitted in and out of polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54); and the optical signal Pi being output at the device output Po (see fig. 1, item Po). Regarding the limitation the material having a higher refractive index than the waveguide, the arguments presented in rejection of claim 1, above, is analogous in rejection of claim 16.

The statements advanced in claims 1-5, 7-10 and 13, above, as to the applicability and disclosure of Candross et al. are incorporated herein.

6. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over combination of Candross et al. and Satoh (US 6,583,910)

Regarding claims 14-15, Chandross teaches a node in an communications network (this recitation has not been given patentable weight because it has been held that a preamble is denied the effect of a limitation where the claim following the preamble is a self-contained description of the structure not depending for completeness upon the introductory clause. Kropa v. Robie, 88 USPQ 478 (CCPA 1951)) comprising:

An optical waveguide device (shown in at least fig. 1) comprising at least one optical input Pi for receiving an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); at least one optical output Po for the output of an optical signal (see fig. 1, item Pi; col. 2, lines 12-16); and an optical waveguide connected between said input Pi and said output Po (see item waveguide between input Pi and output Po); wherein said optical waveguide comprises a strip loaded waveguide 12/13 (see col. 5, lines 48-51; wherein, as shown in at least figures 1 and 3, item waveguides 12/13 are strip loaded waveguides), and the device further comprises an additional material positioned adjacent at least a portion of the waveguide (see col. 3, lines 58-63 and col. 4, lines 51-54), the material having a refractive index, such that an optical signal guided by the waveguide will at least partially couple into the material (see fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transferred through/via polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54).

However, Chandross does not specifically teach (a) wherein the above material having a higher refractive index than the waveguide; and (b) a plurality of nodes, a receiver for receiving a signal, a transmitter for the onward transmission of a signal, at least one of the received signal and the transmitted signal being an optical signal. Regarding limitation (a) the arguments presented in rejection of claim 1, above, are analogous in rejection of claim 14. The above limitation (b) is more specifically taught by Satoh. Satoh teaches a plurality of nodes 51 and 21 in communication network shown in fig, 15 that comprises a receiver 24 for receiving a signal, a transmitter 11 for

the onward transmission of a signal, at least one of the received signal and the transmitted signal being an optical signal (shown in fig. 22, item output light). Thus, Sato provides an optical transceiver in which the transmitted optical signal is optimized (910': see col. 1, lines 14-17). Thus, it would have been obvious to a person of ordinary skill in the art when the invention was made to modify Chandross's optical/communication node shown in fig. 1, by incorporating Satoh's transmitter 11 and receiver 24 having nodes 51/21 in order to transmit and receiving Chandross's input signal P0 so as to construct an optical communication system that includes the above limitations, since the resultant optical system would provide a tunable optical module with improved tuning sensitivity and response (823': see col. 1, lines 48-51).

Response to Arguments and Amendment

7. Applicant's argument filed on 4/09/04 have been fully considered but they are not persuasive.

Applicant alleges (page 8, 3rd parag.) that Chandross does not teach use of a "strip loaded waveguide" shown clearly in figure. 3b of the application and that the waveguides of Chandross are merely conventional 'ridge waveguides' and that Chandross use of the term "strip-like" is totally different from a strip loaded waveguide. Examiner responds that first there is no reference at any part of the Chandross teachings that the waveguides are 'ridge waveguides' as applicant alleges; second Chandross teaches 'strip loaded waveguides' (see col. 5, lines 48-51)--which is essentially analogous in structure shown in applicants' drawing such as figures 3 and 5,

item strip waveguide 106 and referred to in specification at least page 3, lines 31-34 and page 8, 3rd parag. —as follows:

> The waveguide structures in the devices described herein are conventional waveguides with a strip-like configuration and typically rectangular, or preferably essentially square, in cross section.

Regarding claim 1, Applicant asserts (page 8, 4th parag.) that Chandross does not teach an additional material positioned adjacent at least a portion of the waveguide material having a higher refractive index than the waveguide.

The examiner responds that Chandross teaches an additional material positioned adjacent at least a portion of the waveguide, the material having a refractive index, such that an optical signal guided by the waveguide will at least partially couple into the material (see abstract; see at least fig. 13, item polymer 41 filling the coupling region 14 between the waveguides 12 and 13 and light/signals are transferred through/via polymer41 between the waveguides 12 and 13; see abstract and col. 4, 51-54). Though Chandross does not specifically/explicitly teach wherein the above material having a higher refractive index than the waveguide, nevertheless, Chandross states that the material has a high refractive index that optically couples the waveguides 12 and 13 (see abstract and col. 4, lines 51-54). Thus, It would have been to a person of ordinary skill in the art when the invention was made to use the above material with a high refractive index than the waveguide an obvious matter of design choice, since applicant has not disclosed that the choice of having a material with higher index of refraction than the waveguide solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the material

(polymer), and since the reference as well as the claimed invention both use substantially the same materials for waveguide structures, and because such choice of material would provide a tunable coupler with improved tuning sensitivity and response (see col. 1, lines 48-51).

THIS ACTION IS MADE FINAL

8. This action in response to applicant's amendment/arguments made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Informati n

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Cyrus Kianni whose telephone number is (703) 308-1216. The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (703) 308-4881.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 872-9306 (for formal communications intended for entry)

or:

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

K. Cyrus Kianni
Patent Examiner
Group Art Unit 2877

Frank Font
Supervisory Patent Examiner
Group Art Unit 2877

June 16, 2004